

Chapter 1. Envisioning Water Resources Sustainability

For generations, the word “California” has represented much more than a place. To this day, it invokes images of exceptionally satisfying ways of life and well-being coupled with enduring, world-class natural resources. It has offered seemingly endless opportunity for enriching recreation, diverse ways of life, and economic prosperity. Its vast and varied landscapes have enabled ecosystems to thrive.

Yet today, the people of California are living a tale of two extremes — drought and flood. The intensities and impacts from these extremes are expected to increase over time as a result of climate change and changes in land- and water-use patterns. As these trends continue over time, California may no longer provide the benefits, opportunities, or resources for which it has been known around the world. Although all Californians must contribute to a sustainable future, water managers have significant responsibility for ensuring that beneficial conditions and resources endure. Water managers also must coordinate to ensure that the state is positioned to adapt to extreme events, and to reconcile repeated negative impacts with current societal demands.

Since *California Water Plan Update 2013* (Update 2013), extreme events and their consequences have been experienced to varying degrees across the state. What’s more, extreme events are expected to intensify and become increasingly frequent as a result of California’s changing climate. To help reduce the consequences of longer and deeper droughts and more intense runoff, Californians must manage the state’s water resources by taking a more holistic approach with the long view in mind. Water users, planners, managers, and policy-makers must collectively plan and manage California’s water systems proactively, to keep our water systems resilient to changing conditions and able to adapt nimbly and dynamically to challenges. The focus must shift from reacting to extreme events as emergencies to preparing for them in advance. Only proactive, strategic planning and adaptation at local, regional, and statewide levels can secure a sustainable future for California.

California Water Plan Update 2018 (Update 2018) reaffirms the State’s commitment to a sustainable future and describes how the State needs to support and empower local and regional entities to make the vision of sustainable water resources management a reality.

Setting the Context for Update 2018

Update 2018 is the twelfth in a series of California Water Plans prepared since 1957. Update 2018 builds on Update 2013. Since Update 2013, California has suffered through an unprecedented multi-year drought that threatened the water supplies of communities and residents; devastated agricultural production in many areas; worsened groundwater overdraft and subsidence that is affecting the integrity and security of essential water, transportation, and other utility infrastructure; and harmed fish, animals, and their ecosystems. The drought was followed by the wettest year on record, emergency incidents at Oroville Dam, and flooding around the state. These events have called attention to the vulnerability of the state’s aging flood and water management infrastructure.

Californians responded to these challenges by making substantive changes in water resources management. These important initiatives, along with others, are steering California toward managing its complex water systems more sustainably.

- On February 24, 2017, Governor Edmund G. Brown Jr. announced a four-point plan to bolster dam safety and flood protection: 1) invest \$437 million in near-term flood protection and emergency response actions, totaling \$50 billion over the next few decades; 2) require emergency action plans and flood inundation maps for all dams; 3) enhance California’s existing dam safety inspection program; and 4) seek prompt regulatory action and increased funding from the federal government to improve dam safety.
- The *California Water Action Plan* (Water Action Plan), released by Governor Brown’s administration in January 2014 and updated in January 2016, describes a set of essential actions intended to “lay the foundation for sustainable water management in the coming decades” (California Natural Resources Agency et al. 2016). It also framed the multi-State agency emergency response and recovery actions.
- The Sustainable Groundwater Management Act of 2014 (SGMA) set in motion a foundational transformation of the governance, planning, and management of groundwater basins in California. This significant new policy takes a long-term, outcome-driven approach to groundwater management, and closes the loop on California’s water cycle. Inherent in this approach is the understanding that it will take years to contribute toward sustainable groundwater basins, and proactive management will need to continue for generations to keep delivering the intended outcomes.
- Proposition 1 — the Water Quality, Supply, and Infrastructure Improvement Act of 2014 — was passed by the voters in 2014 and made available \$7.5 billion to finance safe drinking water and water-supply reliability programs for California. The water bond provides public funding for public benefits associated with new surface water and groundwater storage projects; regional water-supply reliability; sustainable groundwater management and cleanup; water recycling; flood management; water conservation; and safe drinking water, including specific allocation of funds for disadvantaged communities. The overwhelming success of Proposition 1 at the polls indicated that Californians are willing to invest in water management system improvements.

These important initiatives complement the significant physical improvements in water resource systems and in system management over the past few decades, including substantial investments in conservation, storage, and new water supply and conveyance. Yet, some Californians still face unacceptable risks from flooding; unreliable or unsafe water supplies; and undesirable conditions from groundwater overdraft, habitat degradation, and species declines. Many of California’s ecosystems have become dysfunctional, and much of our water supply and flood protection infrastructure are no longer functioning as intended or have exceeded their design life. Californians are still dependent on many outdated World War II-era investments and innovations. If these trends continue, our future prosperity will be vulnerable to the consequences of such societal catastrophes as droughts, floods, environmental degradation, and species extinctions.

California’s systems for using and managing water are extremely complex and subject to continually changing natural and human-made conditions. Moreover, water resources provide critical support for the success of other dynamic systems: our ecosystems, social systems, and economic and market systems. Because of this complexity, making further improvements is complicated by several key issues and challenges.

- In many parts of the state, people and property are still at risk for catastrophic flooding. One in five Californians live in a floodplain, and more than \$580 billion in assets (i.e., crops, property, and public infrastructure) are at risk.
- Ecosystems continue to decline, and several species are on the brink of extinction.
- Groundwater overdraft, lack of access to clean water in some communities, and unreliable water supplies persist in some regions.
- Often, water management efforts focus on reactive or short-term actions without considering how the actions might contribute to long-term desired outcomes, such as resiliency to changing conditions or sustainability.
- Climate change is having a profound impact on California’s water resources, such as changes in snowpack, sea level, and river flows. The potential change in weather patterns will exacerbate flood risks and add additional challenges for water supply reliability.
- The State of California has no durable process for prioritizing and funding public benefits and local/regional assistance associated with water management and ecosystem protection.

These important challenges cannot be addressed by just tweaking the current system. Public policy must move from stopgap measures to water resource strategies for the generations. This requires rigorous tracking of effectiveness, learning from what works, and adapting ineffective practices and behaviors expeditiously.

Managing Water Resources for Sustainability

Update 2018 promotes a common understanding of what it means to manage and measure water resources for sustainability. Sustainability should become the goal of every Californian because we all benefit from the state’s natural resources. Sustainability is not an end point but an ongoing, resilient, and dynamic balance among four societal values — public health and safety, a healthy economy, ecosystem vitality, and opportunities for enriching experiences. Dynamic balancing is necessary because the relative importance of societal values changes over time. Sustainably managing water resources statewide, based on principles that support effective planning and foster trust, is an effective way to balance basic societal values. (See “Sustainability Outlook: Guiding Principles for Balancing the Four Societal Values” in Chapter 2.)

Governor Brown’s Water Action Plan emphasizes the need to respond to changing conditions and establishes three goals of “more reliable water supplies, the restoration of important species and habitat, and a more resilient, sustainably managed water resources system (water supply, water quality, flood protection, and environment) that can better withstand inevitable and unforeseen pressures in the coming decades” (California Natural Resources Agency et al. 2016). Further, all the changes mandated by SGMA are designed to support the more sustainable use of water.

Importance of State and Regional Alignment

Statewide sustainability is the aggregate of local conditions. To effectively and sustainably manage water resources throughout the state, most of the work must happen at local and regional scales. A primary focus of Update 2018 is describing how State government can support and empower water planning and management practices at the regional scale. Regional and local water agencies and organizations have extensive knowledge of their watersheds, ecosystems, and groundwater basins, even as those regional entities look to the State to fulfill its leadership role.

Given the complexity of the state's water systems (e.g., watersheds, interregional infrastructure, integrated regional water management (IRWM) planning areas, groundwater sustainability planning areas) and Californians' strong emphasis on local control, the most effective water management scale reflects local planning priorities and systemic conditions. State-regional communication and engagement at this scale must be the root of any near-term management. It must also serve as the foundation for any prospective changes to existing planning areas or alignment of regional governance over the long term. Additionally, interactions among regions can increase mutual benefits within California's interconnected water resource systems. Effective regional water management means that strategic planning occurs in an integrated manner across all relevant sectors of water management and geographic scales.

Examples of various water sectors and scales that must be aligned include:

- Fish habitat and flood management at a watershed scale.
- Groundwater use and recharge at an aquifer scale.
- Terrestrial and migratory waterfowl habitat at an ecoregion scale.
- Land and water use at city and county scales.
- Statewide and interstate systems at interregional and interstate scales.

This sector/scale complexity and interconnectivity underscores the importance of IRWM, SGMA, municipalities, and other local/regional entities to successfully align efforts at a water resource-based scale (watershed). Currently, in many areas of the state, regional water management groups (RWMGs) tend to be well-positioned to work with State government to align ongoing and near-term initiatives. These groups are also well-positioned to collaboratively plan for long-term regional governance strategies. The lessons learned from IRWM, SGMA implementation, and other regional partnerships must also be applied to effectively align planning and implementation at a watershed scale.

Long-term Vision and Priorities for Water Resources Sustainability

Update 2018 provides a long-term vision that is aspirational and generational to inspire and guide future policies and investments toward a common vision of California's long-term water future. Managing for sustainability means that water managers must invest in actions that meet today's needs and societal values, without compromising the long-term capacity of the water system to provide for future generations and the natural environment. Water use and management of California's water systems require significant focus on actions and outcomes that support sustainability. The focus must shift toward defining shared outcomes with clear intent and monitoring how, and to what extent, our actions

contribute to sustainability. Moving toward sustainability requires long-lasting commitment; collaboration among State, federal, tribal, and local agencies; and significant financial resources.

Update 2018 envisions a California benefitting from more-effective water policy and investment that is rooted in what Californians value. California's water systems are constantly faced with a tale of two extremes – flood and drought. Over the Update 2018 planning horizon (through 2050), Californians can expect to experience reduced risks of flooding, unreliable water supplies, groundwater depletion, habitat and species declines, and other undesirable conditions. This will require innovative, foundational changes to the way decisions are made, water is regulated, investments are funded, and progress is tracked.

In this sustainable management vision, decisions are increasingly proactive and based on long-term planning. Taking a long-term view, planners and managers synthesize and integrate plans and actions. They also implement actions that are resilient to changing conditions. Water sustainability is more commonly understood in terms of the four societal values. Water resource considerations are appropriately integrated across all State and regional planning processes. Water management investment increasingly results in desired outcomes that are well-articulated before implementation and tracked after implementation. State government funding to fulfill its roles and responsibilities is more stable, based on a State investment plan, and reflects shared intent between State government and California's diverse local governments.

Update 2018 aspires for a future where:

- All Californians are protected from health and safety threats and emergencies.
- California's economy is healthy and all Californians will have opportunities for economic prosperity.
- Ecosystems in the state are thriving.
- All Californians have opportunities for enriching experiences.

Update 2018 provides recommended State actions to address foundational gaps and urgent needs to advance five priorities of Update 2018.

1. Improve Alignment of Agencies' Initiatives and Governance.
2. Improve Regulatory Framework to Reconcile Environmental Needs and Human Activities.
3. Provide Water Managers Resources, Knowledge, Skills, and Tools Needed for Data-Driven Decision-Making.
4. Modernize and Rehabilitate Water Resources Management Systems.
5. Provide Sufficient and Sustainable Funding.

Improve Alignment - Shared intent is identified and governments are aligned behind regionally appropriate investments. State government supports alignment and empowers local and regional water management. State government ensures that regional entities have the incentives, knowledge, tools, authority, and guidance to develop, implement, and enforce water resources management practices for sustainability by:

- Assisting regional entities with building capacity to strengthen governance; establish collaborative management of resources; and provide regional government agencies the necessary data, tools, models, and processes to conduct regional water sustainability assessments.
- Providing technical and facilitation assistance to regions for sustainably managing water resources at the proper scale, and identifying the types of investments and actions needed to realize those desired changes.
- Ensuring assistance to under-represented and economically disadvantaged communities and tribes. These communities are fully embedded in regional water sustainability planning. Traditional/tribal ecological knowledge (TEK) is considered in watershed planning processes.
- Recognizing local knowledge and empowering local agencies to manage their water resources sustainably.

Improve Regulation - The goal is more cost-effective and successful delivery of intended benefits and services. Restored ecosystems, enhanced water reliability, and reduced flood risk occur as a result of regulations being tied to planning and long-term system management. Consistent with “Streamline and Consolidate Permitting,” from Action 8 of the Governor’s Water Action Plan, a dialogue among federal, tribal, State, and local agencies, results in reconciliation and alignment of various regulatory frameworks and statutes. Regulatory incentives, discretion, and alternative compliance pathways are used to accomplish intended outcomes. Reducing uncertainty in this way provides more incentive for investment in green and grey infrastructure. This is accomplished while supporting the four societal values.

Provide Knowledge and Data - More productive policy conversations and shared understanding are occurring. Local, regional, and State governments use a consistent and comprehensive method for assessing sustainability and tracking the effectiveness of policy and investment. Information and data gaps are significantly reduced, increasing desired outcomes and return on investments. State government is equipped to provide stewardship of public funding and consistently reports return on investment.

Modernize Water Management Systems – All Californians enjoy the benefits of increases in water supply reliability, more abundant and sustainable nature resources, and improved health and safety when ecosystems and infrastructure (green and grey infrastructure) are functioning and sustainable. This is accomplished by assessing and prioritizing restoration and rehabilitation needs, and then investing in a manner consistent with priorities.

Provide Funding - Sufficient and stable funding sustains public benefits from past investments by maintaining and modernizing infrastructure. Sufficient funding for data, planning, regulation, governance, and technologies helps ensure the desired outcomes of future water policy and investment. It includes public cost share for rehabilitation, modernization, and operations and maintenance of water resources management systems. Water resources infrastructure (green and grey) are maintained, rehabilitated, or modernized to perform effectively. They are more resistant to impacts from inter-annual hydrologic variability and other uncertainties.

Implementing actions based on these priorities sets the stage for Californians to enjoy a more sustainable water future through 2050 and beyond.

Leveraging Accomplishments and Delivering on Commitments

Building on accomplishments and delivering on commitments is a fundamental planning strategy of Update 2018. Building on accomplishments is the most direct strategy for helping to ensure consistency, efficiency, and ultimately, effectiveness of water policy and investment. Adhering to, and delivering on, commitments, such as the recommendations in Update 2013 or sustaining engagement with local and regional partners, is the most direct strategy for maintaining trust and building on investments in time and relationships. It also minimizes stranded investment resulting from abrupt changes in direction, or abandonment of existing partnerships and governance structures. Delivering on commitments is also the best way to earn and sustain the trust necessary for fruitful partnerships – the foundation of integrated water management.

Update 2013 was encyclopedic in its coverage of water management in California. At more than 3,500 pages, Update 2013 covered a variety of information, from detailed descriptions of current and potential regional and statewide water conditions, to a detailed “Roadmap For Action” that identified potential actions to support 17 objectives. Update 2013 also included detailed reports on each of California's hydrologic regions and overlay areas. Those “state of the region” reports focused on watersheds, groundwater aquifers, ecosystems, floods, climate, demographics, land use, water supplies and uses, and governance. Update 2013 provided an integrated water management toolbox in the form of more than 30 resource management strategies. Discussed were strategies to reduce water demand, increase water supply, improve water quality, practice resource stewardship, improve flood management, and recognize people’s relationship to water.

The comprehensive, detailed nature of Update 2013 informs Update 2018’s more concise call for collaborative, integrated action. Specifically, Update 2018 frames the State of California’s need for:

- More inclusive, integrated, and aligned water planning processes to prioritize and fund long-term, sustainable State/public investment in water resources management.
- Consistent, timely, and practical ways to measure progress and return on public investments over the long term.
- Effective water resources management as an ongoing activity that is continuously evaluated using a cyclic planning and implementation process of:
 - Setting shared intent/outcomes.
 - Assessing past gains and deficiencies.
 - Taking action.
 - Measuring effectiveness.
 - Adapting as needed.
 - Repeating the cycle.

Update 2018's approach to managing California's water resources more sustainably will require time and increased rigor in tracking effectiveness, learning from what is working, and nimbly adapting based on lessons learned.

Successive Water Plan updates will build on Update 2018 by periodically reevaluating the intended outcomes, consistently tracking and reporting on the effectiveness of public and private investments, and revising and refining State policies and investment priorities. This will include conducting annual assessments of the water management system and actions taken to support managing water resources for sustainability. It will provide the water community the opportunity to adjust course if the intended outcomes are not being achieved by past investments and actions.

Whether the word "California" continues to signify the promise of satisfying ways of life, well-being, and enduring natural resources will depend on the choices all Californians make. The recommended actions, funding mechanisms, and implementation plan presented in Update 2018 are intended to guide these choices.